

The brightness of different colors can be altered by varying the amount of black interspersed with the particular color, i.e., spatial dithering. The images also exhibit the pleasing shift of color with respect to viewing angle known as iridescence.

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In another example, a reflective flat panel display may also be fabricated using a single kind of pixel instead of three. Multiple colors, in this case, are obtained through fabricating the pixels in the form of continuously tunable or analog interferometric modulators as described in the parent patent application. In this fashion, any individual pixel may, by the application of the appropriate voltage, be tuned to reflect any specific color. This would require that the array be fabricated on a substrate along with electronic circuitry, or directly on the surface of an integrated circuit, in order to provide a charge storage mechanism. This approach, though it requires a more complicated driving scheme relying on analog voltages, provides superior resolution. It would also find application in a projection system.

In the claims:

Cancel claims 1-19, 21-24, 27, 29-31, and 34-39, without prejudice.

Amend claims 20, 25, 26, 28, 32, and 33 as follows:

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20. A personal electronic product comprising
a surface that is exposed for viewing by a user when the product is in use,
an electronically controllable active display area on the surface, the
display area including an array of interference modulators of light on the surface, the
display area enabling display of graphical images of saturated color, the display area
providing a display portion of an interactive graphical user interface to the user
control elements that provide a control portion of the interactive graphical user
interface, and
a controller connected to the display area and to the control elements and adapted
to control the graphical user interface and its appearance and to provide other functions.

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25. The method of claim 71 in which the surface comprises a face of a time
keeping device.

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and 26. The product of claim 68 or 69 in which the surface comprises a portion of an article of clothing.

a6 28. The product of claim 68 or 69 in which the surface comprises a surface of a sporting good.

32. The product of claim 20 wherein the array also provides information.

a7 33. The product of claim 68 or 69 wherein the display elements comprise liquid crystal, field emission, plasma, organic emitter or other light modulation devices.

Add the following new claims:

--40. The product of claim 20, 68, or 69 further comprising a sensor for determining a state of use of the product and wherein the controller makes a selection based on the state of use.

41. The product of claim 40 in which the state of use is derived from an internal status of the product or the result of a completed internal process.

42. The product of claim 40 further comprising an internal sensor, and in which the state of use is derived from the internal sensor.

43. The product of claim 42 in which the internal sensor senses a characteristic which is internal to the product.

44. The product of claim 42 in which the internal sensor senses a characteristic which is external to the product.

45. The product of claim 40 in which the state of use is derived from an external source.

46. The product of claim 20, 68, or 69 in which a portion of the surface comprises a component incorporated within or on the surface and in which the active display area is on the component.

47. The product of claim 40 in which the state of use comprises a state of a process performed by the product.

48. The product of claim 68 or 69 further comprising a player of a recorded medium.

49. The product of claim 48 in which the medium comprises a compact disk

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50. The product of claim 40 in which the state of use comprises vibration.
51. The product of claim 40 in which the state of use comprises temperature.
52. The product of claim 40 in which the state of use comprises a mode of use.
53. The product of claim 52 in which the mode of use comprises speed of use of an athletic device.
54. The method of claim 52 in which the mode of use comprises strength of stride.
55. The method of claim 71 in which the array spans a substantial portion of the surface.
56. The method of claim 71 in which the appearances include decorative images.
57. The method of claim 71 in which the appearances include areas of variable color and/or brightness.
58. The method of claim 71 further comprising an interface that enables the user to determine which of the appearances is selected.
59. The product of claim 69 in which information about an appearance that may be selected is received from a source external to the product.
60. The method of claim 71 in which the surface comprises a surface of a personal digital assistant.
61. The method of claim 71 in which the surface comprises a surface of a household appliance.
62. The method of claim 71 in which the surface comprises a surface of a motor vehicle.
63. A product comprising
a housing having a surface that is exposed for viewing by a user when the product is in use,
an electronically controllable active display area on the surface, wherein the display area
comprises a substantial portion of the surface of housing, and
is capable of effecting different selectable appearances to the surface that are noticeable to the user,

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a sensor for determining a state of use of the product,
a controller connected to the display area for selecting one of the appearances to reflect the state of use,
an interface that enables the user to instruct the controller with respect to which of the appearances to select, and
wherein information about appearances that may be selected, is received from a source external to the product.

64. The product of claim 63 or 66 in which one portion of the surface comprises a separate component incorporated with the housing and in which the active display area is on the separate component.

65. A method for use with a product that includes a surface that is exposed for viewing by a user when the product is in use, the surface including an electronically controllable active display area that includes an array of interference modulators of light on the surface, the display area providing an image at the surface, the method comprising enabling the display area to impart different selectable appearances to the surface that are noticeable to the user, and selecting one of the appearances to reflect a state of use of the product.

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66. A product comprising
a housing having a surface that is exposed for viewing by a user when the product is in use,

an electronically controllable active display area on the surface, the display area including an array of interference modulators of light on the surface, the display area providing an image at the surface, the display area being capable of effecting different selectable appearances to the surface that are noticeable to the user, and

a controller having a port for receiving information defining the different selectable appearances from an external source, the controller being connected to the display area for selecting one of the appearances for display and for causing the selected appearances to be displayed to the user.

67. An object whose surface is modulated by virtue of the fabrication of an array of interferometric modulation elements on its surface.

68. A consumer product comprising

a surface that is exposed for viewing by a user when the product is in use,

an electronically controllable active display area on the surface,

an element that performs a function for a user of the device, and

a controller that causes the active display to impart to the product an appearance that varies based on the state of use of the product and that is noticeable to the user separately from information that may be conveyed by the active display.

69. A consumer product comprising

a surface that is exposed for viewing by a user when the product is in use,

an electronically controllable active display area on the surface, the active display area including an array of display elements that can be controlled independently, and

a control element that enables a user to select an arbitrary appearance to be imparted to the product by controlling the display elements of the active display area in accordance with the user's selection, the arbitrary appearance of the product being noticeable to the user separately from information that may be conveyed by the active display.

70. The method of claim 71 in which the appearance comprises iridescence.

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71. A method of use with a product that includes an array of interference modulators of light on a surface of the product, the method comprising

causing the product to perform a non-data processing operation or to be subjected to a non-data processing use by a user, the non-data processing operation or use having a condition that changes in the course of the operation or use,

detecting the occurrence of a change in the condition,

in response to the occurrence of the change in condition, selecting one of at least two different overall product appearances to indicate the occurrence to the user, and

controlling the array of interference modulators to impart the selected overall product appearance to the product.

In the drawings:

Insert the following new figures after Figure 35:

Figures 36-44, 45A – 45D, 46A –46D, and 47A – 47D.

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